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DATA COLLECTION FOR DEVELOPING SITE INDEX CURVES FOR PONDEROSA PINE, DOUGLAS-FIR AND WHITE FIR IN ARIZONA, NEW MEXICO AND SOUTHWESTERN COLORADO FINAL REPORT

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Data Collection for Developing Site Index Curves for Ponderosa Pine, Douglas-fir, and White Fir in Arizona, New Mexico, and Southwestern Colorado

Final Report

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Field data collection was completed on November 7, 1985. A total of 1385 ponderosa pines, 1125 Douglas-firs, and 1055 white fires were sampled in a total of 625 stands. The number of trees sampled for each species by ten-year age classes is presented in Table 1. Age classes less than 150 years were adequately sampled (approximately 50 or more trees per age class). As was anticipated in the work plan, it was difficult to locate appropriate site trees greater than 150 years old for each species. However, the total number of trees sampled greater than 150 years old for each species (ponderosa pine - 114, Douglas-fir - 174, white fir - 111) should be adequate to indicate where site curves level off as trees reach older ages. The sample of age classes 40 to 80 reflects the abundance of those classes in southwestern forests.

The number of stands sampled representing different site quality classes (ten-foot site index classes) for each species is presented in Table 2. Site indexes ranging from 71 to 90 feet were sampled most frequently for all three species. Site indexes of 51 to 70 and 91 to 110 were sampled less frequently. Site indexes of less than 50 feet and greater than 110 feet were difficult to locate and were rarely sampled.

A total of 33 habitat types were sampled during the study (Table 3). The most frequently sampled habitat types were the PIPO/FEAR (87 stands), ABCO/QUGA (81 stands), PIPO/QUGA (77 stands), ABCO/ACGL (72 stands), ABCO/BERE (52 stands), PIPO/BOGR (37 stands), and the ABCO/EREX (29 stands) habitat types.

The number of trees sampled by National Forest met the guidelines of the work plan (Table 4).

The mean, maximum, and minimum height of sampled trees by ten-year age classes is presented in Table 5 for each species. Mean heights are indicative of the more rapid height growth rate of young trees with a gradual reduction in height growth as trees mature.

Table 1. Number of trees sampled by ten-year age classes for Ponderosa pine, Douglas-fir, and White fir.

Age Class	NUMBER TREES SAMPLED Ponderosa Pine	Douglas-fir	White Fir
10 - 20	61	63	63
21 - 30	72	55	68
31 - 40	96	71	85
41 - 50	133	83	87
51 - 60	154	72	75
61 - 70	165	81	76
71 - 80	127	74	99
81 - 90	81	89	74
91 - 100	71	77	58
101 - 110	70	77	64
111 - 120	71	59	51
121 - 130	68	35	51
131 - 140	51	58	50
141 - 150	51	57	43
151 - 160	30	49	34
161 - 170	28	37	24
171 - 180	14	31	24
181 - 190	19	31	13
191 - 200	16	14	14
201 - 210	7	12	2
Total	1385	1125	1055

Table 2. Stands sampled by ten-foot site index classes for ponderosa pine, Douglas-fir, and white fir.

Site Index Class	Number of Stands Sampled		
	Ponderosa Pine	Douglas-Fir	White fir
41 - 50	7	1	0
51 - 60	11	22	13
61 - 70	62	39	28
71 - 80	118	84	59
81 - 90	119	75	89
91 - 100	75	54	57
101 - 110	45	24	19
111 - 120	1	0	7
Total	438	299	272

Table 3. Number of stands sampled by habitat type.

Habitat Type	Number of Stands Sampled
PIPO/FEAR	87
ABCO/QUGA	81
PIPO/QUGA	77
ABCO/ACGL	72
ABCO/BERE	52
ABCO/EREX	49
PIPO/BOGR	37
PIPO/QUGA FEAR Phase	29
PIEN/SECA	23
ABCO/QUGA FEAR Phase	14
ABCO/FEAR	11
PIPO/QUEM	11
PIPO/POLO Comm. Type	10
PSME/QUGA	8
ABLA/VASC-LIBO	8
PIPU/FROV EREX Phase	8
PIPO-PIED/QUGA	7
PIPO/MUVI	6
PIPU/PSME	6
PSME/FEAR	5
ABCO/ARUV	5
PIPO/BOGR SCSC Phase	4
PIPO/FEAR BOGR Phase	2
PIPO/MIVI-FEAR	2
PIPO/BOGR QUGA Phase	2
PIPO/FROV CAFO Phase	2
PIPO/MUMO	1
PIPU-PSME PIPO Phase	1
PSME/MUVI	1
PIPU/FROV FEAR Phase	1
PIPU/FROV ACMI Phase	1
ABCO/ACGR	1
PIPO/ARUV	1

Table 4. Number of trees sampled by National Forest for ponderosa pine, Douglas-fir, and white fir.

National Forest	Ponderosa Pine	Douglas-fir	White fir	Total
Apache	185	336	317	838
Carson	109	111	106	326
Cibola	53	0	0	53
Coconino	201	47	53	301
Gila	49	44	46	139
Kaibab	150	99	99	348
Lincoln	43	107	91	241
Prescott	50	0	0	50
San Juan	280	220	216	716
Santa Fe	215	161	127	503
Tonto	50	0	0	50
Total	1385	1125	1055	3565

Table 5. Mean, minimum, and maximum heights by ten-year age classes for ponderosa pine, Douglas-fir, and white fir.

Age Class	Ponderosa Pine				Douglas-fir				White Fir			
	N	Mean	Min.	Max.	N	Mean	Min.	Max.	N	Mean	Min.	Max.
10 - 20	61	18.6	9	27	63	21.0	10	33	63	21.5	13	36
21 - 30	72	27.7	15	37	55	29.4	15	51	68	31.9	15	49
31 - 40	96	36.8	19	53	71	38.6	23	64	85	42.1	20	63
41 - 50	133	45.8	24	69	83	49.3	25	75	87	52.4	28	80
51 - 60	154	53.8	29	78	72	57.4	36	86	75	56.8	33	76
61 - 70	165	63.3	40	84	81	63.4	43	93	76	65.2	44	91
71 - 80	127	70.2	39	94	74	66.8	35	95	99	70.6	32	98
81 - 90	81	74.5	54	101	89	77.9	52	107	74	76.1	47	104
91 - 100	71	78.4	56	104	77	81.8	54	107	58	84.0	54	109
101 - 110	70	81.1	49	115	77	85.9	55	112	64	85.6	57	119
111 - 120	71	85.6	60	111	59	91.2	63	120	51	89.3	68	114
121 - 130	68	86.8	59	112	35	91.6	60	121	51	91.5	59	121
131 - 140	51	95.3	46	119	58	95.6	74	117	50	92.1	57	125
141 - 150	51	94.4	42	121	57	101.1	71	136	43	96.6	60	128
151 - 160	30	96.8	71	126	49	101.8	72	127	34	99.8	67	120
161 - 170	28	99.6	71	142	37	107.6	71	134	24	101.3	83	127
171 - 180	14	107.2	90	128	31	104.3	75	135	24	104.3	78	131
181 - 190	19	105.9	76	124	31	107.2	76	135	13	104.8	60	124
191 - 200	16	108.2	80	130	14	119.9	110	139	14	104.6	81	126
201 - 210	7	112.4	85	137	12	115.5	84	148	2	110.0	108	114